12-2021

Exploring Integration between Athletic Trainers and Strength and Conditioning Coaches among the NCAA Division I Southern Conference Institutions

Yoshihiro Kojima
East Tennessee State University

Exploring Integration between Athletic Trainers and Strength and Conditioning Coaches among the NCAA Division I Southern Conference Institutions

---

A thesis

presented to

the faculty of the Department of Sport, Exercise, Recreation, and Kinesiology

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Master of Science in Sport Science and Coach Education, Applied Sport Science

---

by

Yoshihiro Kojima

December 2021

Kevin Carroll, Ph.D., Chair

Dr. Satoshi Mizuguchi, Ph.D.

Dr. Brian Johnston, Ph.D.

Keywords: interdepartmental integration, communication, collaboration, athletic trainer, strength and conditioning coach

ABSTRACT

Exploring Integration between Athletic Trainers and Strength and Conditioning Coaches among the NCAA Division I Southern Conference Institutions

by

Yoshihiro Kojima

The purpose of this study was to explore the interdepartmental integration between athletic trainers and strength and conditioning coaches in relation to relationship, communication, collaboration, and education. Forty participants from the NCAA Division I Southern Conference, twenty-eight athletic trainers and twelve strength and conditioning coaches, completed an electronic survey during a two-week period. Collected data were analyzed by descriptive and thematic coding analyses. The results suggested participated athletic trainers and strength and conditioning coaches were interactive and collaborative. Open-ended responses identified key concepts when athletic trainers and strength and conditioning coaches communicated and collaborated. A high interaction and collaboration model may be ideal to optimize athletes through rehabilitation while considering injury management, athlete monitoring, training program modifications, and athletic movement correction.

ACKNOWLEDGEMENTS

This project has never been done by myself, but I would like to acknowledge a number of people who were involved. First, I would like to thank all my committee members. Everyone helped me with different perspectives, and I was able to learn from each of committee member. Without participants and external reviewers whom I have contacted, this project would not be also completed. Then I would like to thank the ETSU Athletic Department especially for the sports medicine/athletic training staff and colleagues and everyone in the baseball team. Working as an intern and a graduate assistant athletic trainer with the baseball team will never be the same experiences anywhere else. I most thank all people mentioned above for all the supports at ETSU. Go Bucs!

Finally, I would like to thank my family. I will never forget eight years ago when my parents suggested me going to a college in the United States to become an athletic trainer instead of staying in Japan. It was the beginning of all my journey leading me to arrive in Missouri for the first four years and then three years at East Tennessee State University. Throughout eight years of my American journey, I have met a lot of people who always welcomed me to any places in the US. It was not easy without all of you who always continued supporting myself. Thank you.

TABLE OF CONTENTS

Chapter 1. Introduction

In a sport team or organization, athletic trainers (ATs) provide sports medicine services to manage athletes' health and administer a process of recovering from an injury or illness (Prentice, 2020, p. 3). Strength and conditioning coaches (SCCs) play a role to enhance athletes' performance and develop overall physical capacity (Kontor, 1989). These two professions may often work together to maintain a safe environment during practices and training sessions for athletes (Potach & Grindstaff, 2015; Prentice, 2020). Moreover, ATs and SCCs may overlap each other regarding injury prevention and conditioning/reconditioning athletes through a return to play (RTP) process (Potach & Grindstaff, 2015; Prentice, 2020).

Two integrated models have been proposed in previous literatures. A sports medicine team consists of ATs and SCCs along with other medical and physical science professions that affect athletes' health and performance (Potach & Grindstaff, 2015; Prentice, 2020). This model aims to create a safe environment against accidents such as overtraining and RTP processes after injuries and illnesses (Potach & Grindstaff, 2015; Prentice, 2020). A sport performance enhancement group is another integrated model where ATs and SCCs are engaged to administer an appropriate performance enhancement program by monitoring the process of development (Dotterweich et al., 2013). These models focus on preparing athletes for optimal performance in their sport.

The communication between ATs and SCCs is key to optimal athletic performance, preventing injuries, and making appropriate RTP decisions at the collegiate athletic setting (Courson et al., 2014; Fu et al., 2007; Talpey & Siesmaa, 2017). Miscommunication between ATs and SCCs may result in poor athletic performance, unnecessary athletic injuries, and decreased athlete availability (Dotterweich et al., 2013; Ekstrand et al., 2018; Suprak, 2004).

These two professions should complement each other to assist the athlete in attaining his/her goals (Suprak, 2004). An exploration of the integration between ATs and SCCs in the collegiate setting is warranted.

Definitions

- Athletic Training – Athletic training is health care profession which is categorized under allied health professions and collaborates with physicians to provide athletic training services such as prevention, emergency care, clinical diagnosis, therapeutic intervention and rehabilitation of injuries and medical conditions (Prentice, 2020).
- NATA – National Athletic Trainers' Association is established in 1950 and is "the professional membership organization for athletic trainers and others who support the athletic training profession" (National Athletic Trainers' Association, 2017).
- Certified Athletic Trainer (ATC) – ATC have passed the Board of Certification (BOC) examination following required collegiate education accredited by the Commission on Accreditation of Athletic Training Education (CAATE). BOC requires all ATC to maintain their standards and certifications by completing continuing education requirements (Board of Certification, Inc., 2020).
- Strength coach – Kontor (1989) defined "Strength Coach" as an individual who is responsible to the physical quality of strength related to athletic performance improvements and injury prevention under a sport specific coach.
- Strength and conditioning coach – An individual who is responsible to development of all physical qualities including speed, strength, power, agility, cardiovascular/muscular endurance, and flexibility along with nutritional and drug-free restorative considerations related to athletic performance improvements and injury prevention under a sport specific

coach (Kontor, 1989).

- Strength and conditioning coordinator – in addition to the same responsibility of strength and conditioning coach, a strength and conditioning coordinator "organizes and administers the resources of training facility to obtain the aforementioned goals and objectives including the integration of these activities within the entire athletic department in concert with the head coach, other members of the coaching staff, athletic trainers, team physician and athletic department dietitian, under the direction of the director of athletics" (Konter, 1989).
- NSCA – National Strength and Conditioning Association is a nonprofit association funded in 1978. NSCA sets standards for strength and conditioning practices by providing and managing multiple certifications that includes Certified Strength and Conditioning Specialist (CSCS) (National Strength and Conditioning Association, 2020).
- Interdepartmental integration – a process of interdepartmental interaction and interdepartmental collaboration that brings departments together into a cohesive organization (Kahn & Mentzer, 1996).
- Interdepartmental interaction – the communication aspects associated with interdepartmental activities that addresses verbal and documented information exchanges between departments (Kahn & Mentzer, 1996).
- Interdepartmental collaboration – the willingness of departments to work together which emphasizes working together, having mutual understanding, having a common vision, sharing resources, and achieving collective goals (Kahn & Mentzer, 1996).

Purpose

The primary purpose of this study was to explore the integration between athletic trainers and strength and conditioning coaches regarding their relationship, education, interdepartmental interaction, and interdepartmental collaboration.

Assumptions

1. All participants in this study have worked with either an athletic trainer or a strength and conditioning coach.
2. All participants in this study have worked with at least an injured athlete through the process of rehabilitation and return to play.

Delimitations

- All participants are in the profession of either athletic training or strength and conditioning working at the NCAA Division I Southern Conference Institutions

Limitations

- The study did not have quantitative components such as validity, reliability, and generalization.

Chapter 2. Review of Literature

Qualitative Research Methods

Survey research has evolved into three research approaches. First, quantitative approach examines objective theories and the relationship among variables in the rigorous manner (Austin & Sutton, 2014; Creswell, 2008). Survey instruments in this approach consist of closed-ended questions to generate numeric and statistical variables to confirm or disconfirm hypothesis (Creswell & Creswell, 2018, pp. 3-4). Qualitative approach is another process of survey research widely using open-ended questions (Creswell & Creswell, 2018, p. 4). This approach allows researchers to explore and understand human behaviors or examples of the behavior in a particular context by analyzing description and interpretation (Austin & Sutton, 2014; Creswell & Creswell, 2018, p. 4). Mixed methods research (MMR) is an alternative, integrated process consisting of both quantitative and qualitative approaches (Creswell & Creswell, 2018, p. 4). Closed and open-ended questions are utilized in a sequential or concurrent manner, and both numeric and interpretative data are analyzed to obtain targeted results (Hanson et al., 2005). MMR approach provides a broader understanding of the topic by taking advantages of both quantitative (representativeness and generalizability) and qualitative (contextualization) characteristics (Covell et al., 2012; Hanson et al., 2005).

Validity and Reliability in Qualitative Research Methods

The primary characteristics of quantitative approach are associated with validity, reliability, and objectivity as tools to evaluate the quality of survey (Cypress, 2017; Guba, 1981). Accepted validity strategies are commonly face validity, content validity, criterion validity, and construct validity (Taherdoost, 2016). Face validity is a subjective judgement by experts or external people, referred as the degree to which a new survey or unexamined scale items

measures a targeted construct and objectives appropriately (Hardesty & Bearden, 2004; Taherdoost, 2016). Content validity is similar to face validity but is a construct assessment using statistical, mathematical variables by conducting and analyzing a content validity survey to ask experts simply binary or 5-point scale questions (Hardesty & Bearden, 2004; Taherdoost, 2016). Criterion validity is the degree which a measure is corresponded to a past (postdictive), present (concurrent), or future (predictive) outcome (Taherdoost, 2016). Construct validity is an operationalization process to generate a theoretical construct by establishing convergent (constructs are related to each other theoretically, in reality) and discriminant (constructs are not related to each other theoretically, in reality) validities (Agarwal, 2011). Reliability theories in quantitative approach are commonly internal consistency, test-retest reliability, and inter-rater reliability (Tsang et al., 2017). Internal consistency is the degree of participants' consistency in measurement of the same construct (Tsang et al., 2017). Test-retest reliability is the degree of participants' consistency if the same survey repeats multiple times (Tsang et al., 2017). Inter-rater reliability is the degree of consistency between multiple raters completing the same instrument or survey (Tsang et al., 2017). Objectivity provides insights of generalization of tested theories excluding ones' biases and allows other researchers to repeat the same method to obtain the same results (Creswell & Creswell, 2018, p. 4). These strategies have been developed to evaluate quantitative research.

Instead of validity, reliability and objectivity, qualitative research and naturalism inquiries have replaced "trustworthiness" to measure the quality of truthfulness, applicability, consistency, and neutrality (Creswell, 2008; Cypress, 2017; Long & Johnson, 2000; Thomas et al., 2015, pp. 638–639). According to Guba (1981), trustworthiness is established by credibility, transferability, dependability, and confirmability. Credibility replaces internal validity and gains

the depth of knowledge of the study and participants in a determined context or setting (Guba, 1981; Thomas et al., 2015, pp. 639). Transferability assesses whether the results of the study would be transferable in the same context but other settings. Instead of generalization, qualitative research starts with a small group or area to explore, and then it applies into other areas. Dependability deals with both stable and instable data (Guba, 1981). Because both consistency and inconsistency are valuable in the naturalistic paradigm, qualitative researchers should cope with the instability well (Thomas et al., 2015, pp. 640). Lastly, confirmability gains readers' faith but excludes researchers' bias, motivations, or interests (Sutton & Austin, 2015; Thomas et al., 2015, pp. 640). Lub (2015) explored and argued validity strategies in qualitative research to connect with scientific paradigms and perspectives.

According to Onwuegbuzie and Johnson (2006), mixed methods research (MMR) is not always one or the other to make inferences quantitatively or qualitatively due to the iterative and interactive characteristics. Therefore, they recommended legitimation types for the validity strategies in MMR. Sample integration legitimation deals with sampling designs between quantitative and qualitative to construct meta-inferences. Inside-outside legitimation utilizes both subjective and objective viewpoints and balances two points. Weakness minimization legitimation compensates weakness from one approach by the strengths from other approach. Sequential legitimation copes with the issues caused by a sequential design by reversing the sequence of quantitative and qualitative processes. Conversion legitimation is a technique that data obtained from one approach is analyzed by other. Paradigmatic mixing legitimation is a measure that evaluates one's research epistemological, ontological, axiological, methodological, and rhetorical beliefs successfully underlies quantitative or qualitative approach. Commensurability legitimation allows Gestalt switches between viewpoints of quantitative and

qualitative approaches, and potentially a third viewpoint is created as a result. Multiple validities legitimation establishes validity through quantitative, qualitative, and mixed methods legitimation. Political legitimation deals with power and values of quantitative and qualitative research by simply providing valuable, reasonable results and solutions of the research problem. Validity or a quality of the study instrument in MMR can be approached by legitimation combining quantitative and qualitative methods (Onwuegbuzie & Johnson, 2006).

Strategies to Enhance Trustworthiness in Qualitative Research

As mentioned above, trustworthiness is established by credibility, transferability, dependability, and confirmability (Guba, 1981). To enhance trustworthiness, criteria include "prolonged engagement, persistent observation, thick and rich description, negative case analysis, peer review or debriefing, clarifying researcher's bias, member checking, external audits, and triangulation" (Cypress, 2017). In general, these criteria require phenomenological context and knowledge of participants and research questions (Cypress, 2017; Long & Johnson, 2000). Prolonged engagement and persistent observation occur when a researcher is involved in the context, phenomenon, and situation and gains knowledge (Cypress, 2017; Long & Johnson, 2000). Thick and rich descriptions are obtained with the nature of qualitative research such as open-ended responses (Cypress, 2017; Guba, 1981). Negative cases need to be addressed when analyzing data and potentially removed (Guba, 1981). Peer review and member checking are conducted by allowing colleagues or external experts to review the study (Long & Johnson, 2000), and these also help to remove researcher's bias (Cypress, 2017). External audits and triangulation gain more perspectives by allowing more people to review the study, literature reviews, and checking data and interpretations (Cypress, 2017; Guba, 1981; Long & Johnson, 2000).

Interdepartmental Integration

In marketing and management literatures, interdepartmental integration has been discussed over a few decades and conceptualized as activities between two departments consisting of interaction and collaboration (Kahn & Mentzer, 1996; Kahn, 1996). However, interdepartmental integration may mean differently depending on study characterization such as interaction-based integration, collaboration-based integration, or multidimensional integration which consists of both interaction and collaboration (Kahn, 1996; Kahn, 2001). Even though both interaction and collaboration are important elements, interdepartmental integration has been a vague term (Kahn, 2001).

Interdepartmental Interaction

Interdepartmental interaction (communication) is an information sharing activity through verbal (meetings, phone calls, etc.) or written (documents, electrical messages, etc.) communication tools (Kahn & Mentzer, 1996; Kahn, 1996). Nevertheless, Menon and colleagues (1997) referred interdepartmental interaction as activities consisting of two aspects: connectedness and conflicts. Interdepartmental connectedness is the degree of formal and informal contact between two departments, while interdepartmental conflict is a tension between two departments (Menon et al., 1997). They explained interdepartmental connectedness affected the frequency of information exchange and openness of communication. Interdepartmental conflict is referred as a barrier or an "uncooperative behavior" resulting in poor communication or disfunction between two departments (Menon et al., 1997). In the research from Edwards (2018), poor communication and delayed process between two departments are referred as "problematic interdepartmental relationship." From these perspectives, elements of interdepartmental interaction seem to involve communication, its methods and frequency,

connectedness, conflict, and relationship between two departments.

Interdepartmental Collaboration

Interdepartmental collaboration is a mutual process of engagement where multiple departments interact and work together to achieve a shared goal with a mutual understanding, a common vision, and shared resources (Kahn & Mentzer, 1996). Bedwell and colleagues (2012) defined "collaboration as an evolving process whereby two or more social entities actively and reciprocally engage in joint activities aimed at achieving at least one shared goal." However, in their analysis, collaboration would be an overlapping term that has interchangeably consisted of coordination, cooperation, and teamwork in previous literatures. Coordination consists of the levels of interdependencies towards a collaborative task, cooperation is referred as the levels of attitudes or willingness towards a collaborative task, and teamwork is defined as the level of analysis where one or multiple teams exist in a collaborative activity (Bedwell et al., 2012). Chiocchio et al. (2012) explored collaboration as a team task and defined as "the interplay of situation-appropriate uses of four interrelated processes: teamwork communication, synchronicity, explicit coordination, and implicit coordination." Team members are engaged in activities to establish open interaction and communication, to complete their tasks timely, to perform individual roles and tasks within a team, and to adjust situations (Chiocchio et al., 2012). Therefore, collaboration is a situational process where multiple individuals in the same team or multiple departments are willing to work together towards a shared goal or task in a timely manner. However, its term remains unclear and still needs to be explored to understand what it is (Bedwell et al., 2012).

Interdepartmental Integration Models

Kahn and Mentzer (1996) developed the models of four regions of interdepartmental

integration: 1) low interaction; low collaboration, 2) high interaction; low collaboration, 3) low interaction; high collaboration, and 4) high interaction; high collaboration. Situations such in the low interaction and collaboration may be for the department-specific activities which do not necessarily collaborate with other departments. High interaction but low collaboration environment is suitable if two departments are physically apart. It is also created if the organization forces the interdepartmental integration because more information-sharing activities occur for high interaction. Low interaction and high collaboration occur when situations are flexible and changeable, and when information-sharing would not work due to a limited time to interact. High interaction and collaboration deal with complex situations that clarify and ensure the information and process are properly shared and worked together to achieve a goal. Kahn and Mentzer concluded that high integration may produce high performance; however, it does not encourage interaction and collaboration to be always high between multiple departments. Situations vary, and both flexibility and stability are required to produce a better integration.

Athletic Training Profession

Athletic trainers (ATs) are the healthcare professionals who provide athletic training services or treatments under the direction of or in collaboration with a physician at a variety of setting such as professional sports, collegiate or secondary school athletics, physical therapy clinics, orthopedic clinics, and so on (Prentice, 2020, p. 3). Athletic training services include primary care, injury and illness prevention, wellness promotion and education, emergent care, examination and clinical diagnosis, therapeutic intervention and rehabilitation of injuries and medical conditions (National Athletic Trainers' Association, 2010). National Athletic Trainers' Association (NATA), founded in 1950, has set a standard and regulation for athletic trainers by publishing *Athletic Training Education Competencies*. According to *Athletic Training Education*

Competencies 5th edition (2011), strength training is described in a part of Prevention and Health Promotion (PHP) and Therapeutic Interventions (TI). In the competencies, Domains describing PHP and TI stated that ATs have a role to design and administer strategies and programs to prevent injuries and illnesses and improve overall health by implementing strength, endurance, speed, and power in their designed training. ATs are capable with identifying and describing testing to measure strength, explaining strength training along with the aspect of outcomes, safety protocols, and contraindications, and assessing and monitoring body composition through strength training. Thus, the athletic training education practices injury prevention and therapeutic exercises by administering strength and conditioning training.

Strength and Conditioning Profession

Strength and conditioning is a profession of enhancing physical abilities, improving athletic performance, and preventing injuries by comprising of speed, strength, power, agility, cardiovascular/muscle endurance, and flexibility (Dorgo, 2009; Konter, 1989). According to Konter (1989) strength and conditioning coordinators often collaborate with coaches, athletic trainers, physicians, dietitians, and other considered resources to help athletes develop their athletic ability. As its responsibilities and characteristics, strength and conditioning coaches (SCCs) often face a risk of injuries and accidents during a training session managed by themselves ("NSCA Strength and Conditioning Professional Standards and Guidelines," 2017). Certified Strength and Conditioning Specialists (CSCS) are defined as the "professionals who apply fundamental knowledge in a practical setting to assess, motivate, educate and training athletes for the primary goal of improving sport performance" ("NSCA Strength and Conditioning Professional Standards and Guidelines," 2017). Potach and Grindstaff (2015, pp. 606-607) also suggest that athletes should be referred by CSCS in a case of needs to consult with

other experts such as “medical, dietetics, athletic training, and sport coaching fields.” SCCs can play a vital role within the sports medicine team. With the knowledge and insight of appropriate athletic function during the later stage of rehabilitation, SCCs should be integrated within the rehabilitation and reconditioning program for injured athletes to return to play (RTP) under the consultation of physicians and athletic trainers (Potach & Grindstaff, 2015, pp. 606–607).

Integration between Athletic Trainers and Strength and Conditioning Coaches

Due to the uniqueness and characteristics of ATs and SCCs, both professions often work together at professional teams and most college athletics (Prentice, 2020, pp. 5 & 93). There are two cross-functional models that both ATs and SCCs should engage in: sports medicine team and sport performance enhancement group (SPEG) (Dotterweich et al., 2013; Prentice, 2020, pp. 5 & 93). Sports medicine team is created with various health care professionals in physical activity and sports (Prentice, 2020, p. 5). While medical professionals such as ATs, physical therapists, and physicians oversee injury care and management, SCCs, sport coaches, and sport psychologists take part in sports medicine team as performance enhancement group to optimize athletic performance and conditions (Prentice, 2020, p. 5). SPEG is another integration model where ATs and SCCs participate in and supports sport coaches with various perspectives to accomplish a team’s objective (Dotterweich et al., 2013). Courson et al. (2014) published inter-association consensus statement and stated, “Communication is essential among the athlete, team, physician, athletic trainer, coaches, strength coaches, parents or guardians, spouse, and administration regarding the approval for participation and injury and illness management.” Suprak (2004) discussed the importance of collaboration between SCCs and ATs. The author indicated that the collaboration plays a role towards injury prevention, injury rehabilitation, and performance enhancement. While annual training plan is designed to achieve peak performance,

there is always a risk of overtraining and an injury. Therefore, injury prevention is the most challenging both strength and conditioning and athletic training professionals (Suprak, 2004). Ekstrand et al. (2019) conducted qualitative research to assess the communication levels in European soccer teams and investigated the low communication quality between the sports medicine and sport performance resulted lower player availabilities. Integration between ATs and SCCs is a key to protect athletes from further injuries and optimize athletes' conditions for their competitions. There was no empirical research regarding integration specifically between ATs and SCCs.

Chapter 3. Exploring Integration between Athletic Trainers and Strength and Conditioning Coaches among the NCAA Division I Southern Conference Institutions

Original Investigation

Y. Kojima[1], K.M. Carroll[1], B.D. Johnson[2], S. Mizuguchi[1]

[1]Department of Sport, Exercise, Recreation, and Kinesiology, East Tennessee State University

[2]Global Sport Leadership, School of Graduate Studies, East Tennessee State University

Corresponding Author:

Yoshihiro Kojima

PO Box 70654

East Tennessee State University

Phone: 423-439-4655

Email: kojima@etsu.edu

Abstract

The purpose of this study was to explore the interdepartmental integration between athletic trainers and strength and conditioning coaches in relation to relationship, communication, collaboration, and education in the National Collegiate Athletic Association (NCAA) Division I Southern Conference. Forty (n = 40) participants, twenty-eight (n = 28) athletic trainers (ATs) and twelve (n =12) strength and conditioning coaches (SCCs), completed an electronic survey during a two-week period. Collected data were analyzed by descriptive and thematic coding analyses. The results suggested overall integration between participated ATs and SCCs was interactive and collaborative. Open-ended responses identified key concepts when ATs and SCCs communicate and collaborate. A high interaction and collaboration model may be ideal to benefit athletes while considering injury management, athlete monitoring, training program modifications, and athletic movement corrections.

Introduction

In a sport team or organization, athletic trainers (ATs) provide athletic training services to manage athletes' health and administer a process of recovering from an injury or illness (Prentice, 2020, p. 3). Strength and conditioning coaches (SCCs) play a role to enhance athletes' performance and develop overall physical capacity (Kontor, 1989). These two professions may often work together to maintain a safe environment during practices and training sessions for athletes (Potach & Grindstaff, 2015; Prentice, 2020). Moreover, ATs and SCCs may overlap each other regarding injury prevention and conditioning/reconditioning athletes through a return to play (RTP) process (Potach & Grindstaff, 2015; Prentice, 2020).

Two integrated models have been proposed in previous literatures. A sports medicine team consists of ATs and SCCs along with other medical and physical science professions that affect athletes' health and performance (Potach & Grindstaff, 2015; Prentice, 2020). This model aims to create a safe environment against accidents such as overtraining and RTP processes after injuries and illnesses (Potach & Grindstaff, 2015; Prentice, 2020). A sport performance enhancement group (SPEG) is another integrated model where ATs and SCCs should be engaged to administer an appropriate performance enhancement program by monitoring the process of development (Dotterweich et al., 2013). These models should be the best benefits and interests for athletes to compete in their sport.

Therefore, the communication between ATs and SCCs is key to optimal athletic performance as well as preventing injuries and making appropriate RTP decisions at the collegiate athletic setting (Courson et al., 2014; Fu et al., 2007; Talpey & Siesmaa, 2017). Miscommunication between ATs and SCCs may result in poor athletic performance, unnecessary athletic injuries, and decreased athlete availability (Dotterweich et al., 2013; Ekstrand et al.,

2018; Suprak, 2004). These two professions should complement each other to assist the athlete in attaining his/her goals (Suprak, 2004). An exploration of the integration between ATs and SCCs in the collegiate setting is warranted.

Kahn and Mentzer (1996) defined interdepartmental integration as activities of interaction and collaboration between two entities (Kahn & Mentzer, 1996). Although interdepartmental interaction produces verbal and written communication activities (Kahn & Mentzer, 1996), it may also consist of connectedness (the degree of formal and informal contact between two departments) and conflict (a tension between two departments) (Menon et al., 1997). Interdepartmental collaboration is defined as a situational process where multiple individuals in the same team or multiple departments are willing to work together towards a shared goal or task in a timely manner (Bedwell et al., 2012; Chiocchio et al., 2012; Kahn & Mentzer, 1996).

Although previous literatures have discussed the importance of effective integration between ATs and SCCs (Fu et al., 2007; Suprak, 2004; Talpey & Siesmaa, 2017), there is no empirical research having assessed specifically the integration between ATs and SCCs. Therefore, the primary purpose of this study was to qualitatively explore the integration between ATs and SCCs in regard to their relationship, communication, interaction, education, and collaboration at the NCAA Division I Southern Conference.

Methods

This study was designed qualitatively. The East Tennessee State University (ETSU) Institutional Review Board (IRB) reviewed and approved the study. Participants were identified from ATs and SCCs working at one of the National Collegiate Athletic Association (NCAA) Division I Southern Conference institutions. The Southern Conference is a mid-major conference

where ten-member institutions compete thirteen sports in states of Alabama, Georgia, North Carolina, South Carolina, Tennessee, and Virginia (*The History of the Southern Conference*, n.d.). The survey was created using SurveyMonkey and conducted for two weeks from February 24 to March 10, 2021, by identifying the appropriate ATs and SCCs using publicly access staff directories of each SoCon institution. The survey included a mixture of closed- and open-ended questions which allowed participants to freely explain details in addition to answering closed-ended questions, as well as allowing the researcher to understand participants' perspectives and phenomena. Open-ended questions on web survey were added because participants tended to answer with more themes and elaborations than paper survey (Smyth et al., 2009). The invitation email was sent to ATs and SCCs (N=120) at 9:00 am on February 24, 2021 and another email on March 3, 2021 as a reminder. The eligibility criteria for this survey included: agreeing to volunteer following the survey information, being at least 18 years old, being physically in the United States, and being in the athletic training or strength and conditioning profession in the Southern Conference.

Instrument Development

Survey questions were developed through literature reviews. According to Kahn and Mentzer (1996), interdepartmental integration consists of interaction (communication) and collaboration between two departments. The definition of interdepartmental interaction by Menon and colleagues (1997) was activities consisting of two aspects: connectedness and conflicts. Interdepartmental connectedness is the degree of formal and informal contact between two departments, while interdepartmental conflict is a tension between two departments (Menon et al., 1997). Collaboration is defined as a situational process where multiple individuals in the same team or multiple departments are willing to work together towards a shared goal or task in

a timely manner (Bedwell et al., 2012; Chiocchio et al., 2012). Edwards (2018) stated poor communication and delayed process between two departments are referred as "problematic interdepartmental relationship." Both *Athletic Training Educational Competencies 5th Edition* (2011) and *NSCA Strength and Conditioning Professional Standards and Guidelines* (2017) discussed their basic ability to understand each other's ideas through their coursework. To sum up, questions were created with an intention to address categories of interdepartmental relationship, interaction, collaboration, and educational background. The questions for interdepartmental relationship consisted of a 5-point scale question to evaluate relationship effectiveness and an open-ended response to reflect participants' choice of the previous question. The communication questions included the quality (5-point scale), methods (choices for all that apply; in-person meeting, phone, text message, email, virtual, other, and no communication), and frequency (choose one; every day, a few times a week, about once a week, a few times a month, once a month, and less than once a month). The education questions began with a dichotomous question to see if participants have taken a course of opposed profession either athletic training or strength and conditioning, and then if they have, another question appeared to ask if the course helped them to communicate with the other profession. The open-ended section was added to allow participants to expand their answer following second question. For collaboration, participants were asked two dichotomous questions in aspects of collaboration and shared vision though a rehabilitation or RTP process. They had an opportunity to add their open-ended responses after each question to allow participants to expand their choices regarding collaboration and shared vision. After the initial survey was created, an expert review was conducted by three professionals in the athletic training and strength and conditioning fields to evaluate the survey to gain peer debriefing (Cypress, 2017; Hamson-Utley et al., 2008; Heaney

et al., 2017). Feedback was taken from those experts and used to refine the survey questions. After the expert review, questions were reviewed through previous literatures. A 5-point scale question regarding relationship was verified by Kane and Borgatti (2011), and another 5-point scale question regarding communication quality was verified by Mathieu et al. (2006). Appendix A shows the actual survey.

Data Analysis

Collected data were quantitatively and qualitatively analyzed by descriptive analysis and thematic coding. Chi-square and Fisher's exact tests were used to compare survey responses between ATs and SCCs (Song et al., 2020). During the coding process, inter-coder reliability (ICR) was also conducted by three external coders (Bernard et al., 2016, pp. 256–260).

Trustworthiness

This survey and study established trustworthiness by developing credibility, transferability, dependability, and confirmability (Guba, 1981). Criteria included purposive sampling, "prolonged engagement, persistent observation, thick and rich description, negative case analysis, peer review or debriefing, clarifying researcher's bias, member checking, external audits, and triangulation" (Cypress, 2017; Guba, 1981). First, purposive sampling was used in this study as it was emergent research to find out what was important. The author has prolongedly engaged and persistently observed the situations between ATs and SCCs by having worked for three years as an AT with multiple other ATs and SCCs (Cypress, 2017; Long & Johnson, 2000). Thick and rich descriptions were obtained through the thorough description of this study and the expert review (Cypress, 2017; Guba, 1981). Negative cases were addressed when analyzing data and invalid data were removed (Guba, 1981). Peer review and member checking were conducted by the expert review, committee members, and external coders (Long

& Johnson, 2000; Taherdoost, 2016), these modified the author's bias (Cypress, 2017). By mixing of closed- and open-ended questions with its quantitative and qualitative analyses, triangulation was achieved (Cypress, 2017; Guba, 1981; Long & Johnson, 2000). Experts review and external coders were also considered as external audits (Cypress, 2017; Guba, 1981).

Results

Forty-two (n=42; 35%) responses were received, while two responses were entirely incomplete. Therefore, forty (n=40) participants completed survey with at least one question. Twenty-eight (n=28) were in the athletic training profession, and twelve (n=12) were in the strength and conditioning profession. All variables were shown in Appendix C and Appendix D. Missing values were not included in the tables. Appendix C shows descriptive analysis, and Appendix D shows identified codes and analysis.

Relationship between ATs and SCCs

The 5-point scale question did not show a statistically significant relationship between the type of professions and the relationship effectiveness based on a 2x3 Chi-square test (Fisher's exact test $p = 0.499$). Majority of ATs and SCCs responded very or extremely effective (78.6%; 75.0%). The relationship between the type of professions and identified codes were not also statistically significant (2x2 Chi square test; Fisher's exact test $p = 0.41$; 1; 0.68; 0.68; 0.68; 1). Codes included good relationship (ATs: 82.1%; SCCs: 66.7%), bad relationship (14.3%; 8.3%), mutual understanding (82.1%; 75%), shared goal (82.1%; 75%), working together (82.1%; 75%), and injury management (50%; 50%). Inter-coder reliability (ICR) on the codes were 89% for ATs and 78% for SCCs.

Communication between ATs and SCCs

The relationship between the type of profession and the communication quality was not

statistically significant because of a 2x4 Chi-square test (Fisher's exact test $p = 0.765$), and majority of ATs and SCCs responded their communication quality were high or very high (89.2%; 91.7%). The relationship between the type of profession and the communication frequency was statistically significant (2x4 Chi-square test; Fisher's exact test $p < 0.05$). Then, 2x2 Chi-square tests were performed on each variable and showed that the relationship between the type of profession and daily communication (Fisher's exact test $p < 0.05$) and communication for a few times a week (Fisher's exact test $p < 0.05$) were statistically significant. Odds ratio for daily communication between ATs and SCCs was 0.129, while the ratio for communication for a few times a week between ATs and SCCS was 12.692. The types of communication method did not have statistically significant relationship with the types of profession excluding virtual meetings (Fisher's exact test $p < 0.01$).

Educational Courses for the Opposed Profession

A 2x2 Chi-square test and Fisher's exact test did not show statistical significance on the relationship between the types of profession and the opposed educational course that ATs or SCCs have taken (Fisher's exact test $p = 0.48$) or the relationship between the types of profession and the course effectiveness that prepared each profession to communicate with other (Fisher's exact test $p = 0.34$). Open-ended responses did not also have statistical significance between the type of profession and identified codes (2x2 Chi-square; Fisher's exact test $p = 1$; 0.57; 0.4; 0.09; 1). Codes were included helped in productive communication (47.1%; 37.5%), not helped in productive communication (11.8%; 25%), sports med foundation (47.1%; 25%), injury pathology (0%; 25%), and similar credential (5.9%; 0%) (ICR = 73%; 100%).

Collaboration between ATs and SCCs

A 2x2 Chi-square test with Fisher's exact test did not show the statistically significant

relationship between the type of profession and the collaboration though rehabilitation (Fisher's exact test $p = 0.66$) or between the type of profession and the shared vision through rehabilitation (Fisher's exact test $p = 1$). From the collaboration question, there was a statistically significant relationship between the type of profession and an identified code "Return to play" (Fisher's exact test $p < 0.01$; OR = 0.06), while other codes did not have statistically significant relationship with type of profession. Codes from the collaboration question included collaboration (57.1%; 36.4%), productive communication (57.1%; 36.4%), open to other's ideas (28.6%; 54.5%), not open to other's ideas (0%; 18.2%), return to play (RTP) (7.1%; 54.5%), and program modifications (53.6%; 27.3%) (ICR = 89%; 78%). A 2x2 Chi-square test did not show the statistically significant relationship between types of profession and each identified code on the question regarding shared vision (Fisher's exact test $p = 0.31$). Codes were shared vision (42.9%; 36.4%), not share vision (10.7%; 36.4%), preemptive communication (3.6%; 18.2%), injury prevention (17.9%; 36.4%), athlete monitoring (0%; 18.2%), and movement correction (7.1%; 18.2%) (ICR = 78%; 89%).

Discussion

The primary purpose of this study was to explore the integration between ATs and SCCs in relation to their relationship, communication, collaboration, and education in the NCAA Division I Southern Conference. Overall integration between participated professions was interactive and collaborative. The educational courses helped participants to communicate with other profession. Most of participants had a shared vision through rehabilitation. The open-ended responses identified key concepts that ATs and SCCs concerned when they communicated and collaborated with each other. These identified perspectives were matched with objectives of proposed integrated models (sports medicine team and SPEG) and previous literatures regarding

the standards and competencies of athletic training and strength and conditioning.

Relationship between ATs and SCCs

Most participated ATs and SCCs had effective relationship with opposed profession. They also tended to respond good relationship, mutual understanding, shared goal, and working together regarding the effective relationship. Therefore, both closed- and open-ended responses identified there was an effective relationship between participated ATs and SCCs. Menon and colleagues (1997) indicated that interdepartmental relationship should be achieved formally and informally through the improvement of communication and collaboration (Menon et al., 1997). For example, communication does not always require a formal meeting, phone call, or written methods. A few responses from the survey stated "in-person check in" which was made when ATs and SCCs saw each other in a random place but still made an information exchange. Informality of relationship and timing of communication may help a smooth and effective communication (Menon et al., 1997). In addition to communication, collaboration elements were found in open-ended responses among participants such as "mutual understanding, shared goal, and working together" (Bedwell et al., 2012). As injury management was indicated and discussed in parts of communication and collaboration by 50.0% of participants, the effective relationship between ATs and SCCs may be also caused by how each AT and SCC communicates and collaborates through injury management.

Communication between ATs and SCCs

The communication quality was high between participated ATs and SCCs, and most communication methods were utilized among participated ATs and SCCs. This may make an open path of communication between participants (Fu et al., 2006). The result on the communication frequency indicated that more ATs would communicate for a few times a week

than SCCs who would communicate daily. From other open-ended responses, several participants indicated injury data or reports were distributed from ATs daily and utilized as an information exchange between ATs and SCCs to manage injuries. However, this may lead to ATs not as frequently communicating as SCCs because specific updates on injured athletes would depend on the stage of rehabilitation or the frequency of injury occurrence.

Educational courses

The results showed that participated ATs and SCCs likely stated they had taken a course related to opposed profession. From observation, more ATs (39.3%) had not taken a course related to strength and conditioning than SCCs with athletic training or sports medicine related courses (25.0%). This could be the result of the specific requirement of athletic training curriculum. According to Commission on Accreditation of Athletic Training Education (2018), an athletic training program is required to provide students with a course related to interventions for pre- and post-operative patients and patients with nonsurgical treatment such as functional training and cardiovascular training. However, such interventions are medically administered and may lack strength and conditioning perspectives including athlete development and performance enhancement. Reiman and Lorenz (2011) suggested strength and conditioning principles into any rehabilitation programs. Moreover, Kakavas et al. (2020) indicated that linear or non-linear periodization theories should be useful and applicable into a post-operative anterior cruciate ligament rehabilitation as well as other sport injuries, while the traditional rehabilitation was developed progressive overload. Therefore, while one of primarily roles of ATs is designing rehabilitation programs, SCCs may be capable of supporting ATs by overseeing progressive strength and conditioning activities with their knowledge and skills as a part of sports medicine team. This is where collaborative strategies may have to be developed between ATs and SCCs.

Collaboration between ATs and SCCs

The current study indicated collaboration between most participated ATs and SCCs were made, and most of them had the shared vision through rehabilitation. Even though some ATs did not collaborate with SCCs, there seemed to be a mutual trust towards SCCs regarding program modifications when necessary. RTP was indicated by SCCs more than ATs for a collaborative activity as they mentioned they collaborated with ATs during the rehabilitation process. ATs and SCCs noted that collaborative activity during rehabilitation included injury prevention, program modification, athlete monitoring, and movement corrections. These are matched with visions of integrated models of sports medicine team and SPEG (Dotterweich et al., 2013; Fu et al., 2007). In the study of Dotterweich and colleague (2013), ATs played a valuable role to provide new and preexisting injury information regarding individual athletes, and then SCCs utilized this information to design a training plan and maintain athletes' health.

Practical Application

This current study indicated that participated ATs and SCCs integrated overall. As Kahn and Mentzer (1996) conceptualized, these ATs and SCCs may fit in the high communication and collaboration model. This situation may make a complex environment but also produce high quality product (Kahn & Mentzer, 1996). To maintain this environment, communication and collaboration may need to be balanced along with the awareness of multidimensional perspectives (Kahn & Mentzer, 1996). As integration may include behavioral aspects such as willingness and efforts (Bedwell et al, 2012), informality of communication and collaboration may create inline interdepartmental integration (Bedwell et al, 2012; Kahn & Mentzer, 1996; Kahn, 1996). Although ATs and SCCs may deal with multiple athletes for their individual injuries and conditions, holistic and comprehensive approaches were discussed in sports

medicine team and SPEG to achieve athletes' best interest (Dotterweich et al., 2013; Fu et al., 2007). ATs and SCCs may make an open path of integration to communicate and collaborate within the shared tasks such as injury management, program modifications, and return to play to accomplish the interdepartmental integration. In addition, there are other situations that Kahn and Mentzer discussed: low interaction and collaboration, high interaction but low collaboration, and low interaction but high collaboration. The low interaction and collaboration model takes place when department specific activities occur (Kahn & Mentzer, 1996). For AT-SCC integration, it may occur when minor injuries that may not require any training modifications or when healthy individuals do not need any injury management. High interaction and low collaboration occur where two departments are physically apart (Kahn & Mentzer, 1996). This may be possible when two locations such as an athletic training room and a weight room are far from each other, and both professions are simply unable to collaborate more than information exchanges. The last situation is low interaction but high collaboration. This situation may be very flexible and changeable causing the demand of high collaboration, but interaction is limited due to a limited time (Kahn & Mentzer, 1996). Shared tasks such as injury prevention, athlete monitoring, training program modifications, and RTP may require flexibility and frequent changes to benefit and optimize athletes within a limited time due to working hours and responsibilities from both professions. Even though these models may be practically applied, situations vary, and this study does not suggest the best interdepartmental integration model at respective institutions.

Conclusion

This study aimed to explore interdepartmental integration between ATs and SCCs among the NCAA Division I Southern Conference institutions in relation to relationship, communication, collaboration, and education. Overall, the integration between participated

professions was interactive and collaborative. The interdepartmental relationship between two professions seemed to depend on communication and collaboration through injury management. The educational courses seemed to help both ATs and SCCs in a productive communication with each other, although more ATs had not taken the strength and conditioning course than SCCs with the athletic training course. Open-ended responses explored participants' perspectives through the integration and identified key concepts such as injury prevention, training program modification, and movement corrections as integrative activities.

This study leaves future research questions. First, since this study identified the interdepartmental activities such as injury prevention and training program modification, it is necessary to specifically explore them. As these activities are overlapped by both athletic training and strength and conditioning, responsibilities may need to be clear because there would be a risk which is associated with injuries (Potach & Grindstaff, 2015; Prentice, 2020). An injury is the primary concern and should be avoided during a rehabilitation program, and both ATs and SCCs are often exposed to this risk (Potach & Grindstaff, 2015; Prentice, 2020). Therefore, if the responsibilities are clarified to properly assign ATs and SCCs with specific tasks to own the risk, then they may become more supportive with each other and start communicating and collaborating. As communication and collaboration may include formality and informality, willingness, and mutual understanding (Bedwell et al., 2012; Kahn, 1996; Menon et al., 1997), behavioral qualities may need to be addressed along with interpersonal relationship rather than interdepartmental (Menon et al., 1997). Strong relationships may improve communication and collaboration, leading to the better interdepartmental activities and performance (Fu et al., 2007; Menon et al., 1997). Lastly, performance quality may need to be assessed as a result of interdepartmental integration. Prevention of reinjury and proper reconditioning may indicate

integration quality between ATs and SCCs. Overall, since the purpose of this study was primarily to explore the integration between ATs and SCCs, future study may need to address risk and responsibility clarification, interpersonal relationship in relation to behavior, and performance quality caused by interdepartmental integration.

A limitation of this study is a lack of quantitative fundamentals. This study was designed using qualitative research methods. Therefore, this study failed to establish generalization because of purposive sampling and strategies of trustworthiness (Cypress, 2017; Guba, 1981; Long & Johnson, 2000). In quantitative approach, probability sampling is commonly used to develop generalization with a purpose of excluding biases (Bernard et al., 2016, p. 39). Instead of trustworthiness, validity and reliability are still utilized in survey research (Cypress, 2017; Long & Johnson, 2000). While qualitative approach enhances participants' rich insights and perspectives (Cypress, 2017; Long & Johnson, 2000; Smyth et al., 2009; Sutton & Austin, 2015), quantitative approach gains more generalized conclusions (Creswell, 2008). In this study, face validity was used to ensure survey questions were appropriate in this study (Cypress, 2017; Long & Johnson, 2000). In addition, even though the researcher's bias was considered to be minimized by face validity and inter-coder reliability, participants' biases were not well controlled. It would be possible that more ATs and SCCs who would integrate each other might participate and complete this survey than those who would not. This study hopes to provide awareness that ATs and SCCs may need to seek, as it was a novel study in the author's understanding. Therefore, future research will necessarily minimize these limitations.

References

Bedwell, W. L., Wildman, J. L., DiazGranados, D., Salazar, M., Kramer, W. S., & Salas, E. (2012). Collaboration at work: An integrative multilevel conceptualization. *Human Resource Management Review*, *22*(2), 128–145. https://doi.org/10.1016/j.hrmr.2011.11.007

Bernard, R. H., Ryan, G. W., & Wutich, A. Y. (2016). *Analyzing Qualitative Data: Systematic Approaches* (Second ed.). SAGE Publications, Inc.

Chiocchio, F., Grenier, S., O'Neill, T. A., Savaria, K., & Willms, J. D. (2012). The effects of collaboration on performance: a multilevel validation in project teams. *International Journal of Project Organisation and Management*, *4*(1), 1. https://doi.org/10.1504/ijpom.2012.045362

Commission on Accreditation of Athletic Training Education. (2018, February). *2020 Standards for Accreditation of Professional Athletic Training Programs Crosswalk*. https://caate.net/pp-standards/

Courson, R., Goldenberg, M., Adams, K. G., Anderson, S. A., Colgate, B., Cooper, L., Dewald, L., Floyd, R., Gregory, D. B., Indelicato, P. A., Klossner, D., O'Leary, R., Ray, T., Selgo, T., Thompson, C., & Turbak, G. (2014). Inter-Association Consensus Statement on Best Practices for Sports Medicine Management for Secondary Schools and Colleges. *Journal of Athletic Training*, *49*(1), 128–137. https://doi.org/10.4085/1062-6050-49.1.06

Creswell, J. W. (2008). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (3rd ed.). SAGE Publications, Inc.

Cypress, B. S. (2017). Rigor or Reliability and Validity in Qualitative Research. *Dimensions of Critical Care Nursing*, *36*(4), 253–263. https://doi.org/10.1097/dcc.0000000000000253

Dotterweich, A. R., Swisher, A., Clendenin, S., Palmero, M., Greene, A. E., & Walker, J. T. (2013). Creation of a Sport Performance Enhancement Group Using a Benefits-Based Programming Model. *Journal of Coaching Education*, *6*(1), 76–95. https://doi.org/10.1123/jce.6.1.76

Edwards, F. J. (2018). Good Interdepartmental Relationships: The Foundations of a Solid Emergency Department. *Advanced Journal of Emergency Medicine*, *2*(2), e14. https://doi.org/10.22114/AJEM.v0i0.54

Ekstrand, J., Lundqvist, D., Davison, M., D'Hooghe, M., & Pensgaard, A. M. (2018). Communication quality between the medical team and the head coach/manager is associated with injury burden and player availability in elite football clubs. *British Journal of Sports Medicine*, *53*(5), 304–308. https://doi.org/10.1136/bjsports-2018-099411

Fu, F. H., Tjoumakaris, F. P., & Buoncristiani, A. (2007). Building a Sports Medicine Team. *Clinics in Sports Medicine*, *26*(2), 173–179. https://doi.org/10.1016/j.csm.2006.12.003

Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *ECTJ*, *29*(2). https://doi.org/10.1007/bf02766777

Hamson-Utley, J. J., Martin, S., & Walters, J. (2008). Athletic Trainers' and Physical Therapists' Perceptions of the Effectiveness of Psychological Skills Within Sport Injury Rehabilitation Programs. *Journal of Athletic Training*, *43*(3), 258–264. https://doi.org/10.4085/1062-6050-43.3.258

Heaney, C. A., Rostron, C. L., Walker, N. C., & Green, A. J. (2017). Is there a link between previous exposure to sport injury psychology education and UK sport injury rehabilitation professionals' attitudes and behaviour towards sport psychology? *Physical*

Therapy in Sport, *23*, 99–104. https://doi.org/10.1016/j.ptsp.2016.08.006

The History of the Southern Conference. (n.d.). Southern Conference. Retrieved August 15, 2021, from https://soconsports.com/sports/2008/6/30/177772.aspx

Kahn, K. B. (1996). Interdepartmental Integration: A Definition with Implications for Product Development Performance. *Journal of Product Innovation Management*, *13*(2), 137–151. https://doi.org/10.1111/1540-5885.1320137

Kahn, K. B., & Mentzer, J. T. (1996). Logistics and interdepartmental integration. *International Journal of Physical Distribution & Logistics Management*, *26*(8), 6–14. https://doi.org/10.1108/09600039610182753

Kakavas, G., Malliaropoulos, N., Bikos, G., Pruna, R., Valle, X., Tsaklis, P., & Maffulli, N. (2020). Periodization in Anterior Cruciate Ligament Rehabilitation: A Novel Framework. *Medical Principles and Practice*, *30*(2), 101–108. https://doi.org/10.1159/000511228

Kane, & Borgatti. (2011). Centrality-Is Proficiency Alignment and Workgroup Performance. *MIS Quarterly*, *35*(4), 1063. https://doi.org/10.2307/41409973

Kontor, K. (1989). Editorial: Defining a profession. *National Strength & Conditioning Association Journal*, *11*(4), 75. https://journals.lww.com/nsca-scj/Citation/1989/08000/EDITORIAL__Defining_a_profession.11.aspx

Long, T., & Johnson, M. (2000). Rigour, reliability and validity in qualitative research. *Clinical Effectiveness in Nursing*, *4*(1), 30–37. https://doi.org/10.1054/cein.2000.0106

Mathieu, J. E., Gilson, L. L., & Ruddy, T. M. (2006). Empowerment and team effectiveness: An empirical test of an integrated model. *Journal of Applied Psychology*, *91*(1), 97–108. https://doi.org/10.1037/0021-9010.91.1.97

Menon, A., Jaworski, B. J., & Kohli, A. K. (1997). Product Quality: Impact of Interdepartmental

Interactions. *Journal of the Academy of Marketing Science*, *25*(3), 187–200. https://doi.org/10.1177/0092070397253001

NATA Professional Education Council. (2011). *Athletic Training Education Competencies 5th Edition*. Commission on Accreditation of Athletic Training Education. https://caate.net/wp-content/uploads/2014/06/5th-Edition-Competencies.pdf

NSCA Strength and Conditioning Professional Standards and Guidelines. (2017). *Strength & Conditioning Journal*, *39*(6), 1–24. https://doi.org/10.1519/ssc.0000000000000348

Potach, D. H., & Grindstaff, T. L. (2015). Rehabilitation and Reconditioning. In G. G. Haff, T. N. Triplett, & National Strength and Conditioning Association (Eds.), *Essentials of Strength Training and Conditioning* (4th ed., pp. 605–620). Human Kinetics.

Prentice, W. (2020). *Principles of Athletic Training: A Guide to Evidence-Based Clinical Practice* (17th ed.). McGraw-Hill Education.

Reiman, M. P., & Lorenz, D. S. (2011). Integration of strength and conditioning principles into a rehabilitation program. *International Journal of Sports Physical Therapy*, *6*(3), 241–253. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3164002/

Smyth, J., Dillman, D., Christian, L., & McBride, M. (2009). Open-Ended Questions in Web Surveys: Can Increasing the Size of Answer Boxes and Providing Extra Verbal Instructions Improve Response Quality? *The Public Opinion Quarterly*, *73*(2), 325–337. http://www.jstor.org/stable/25548082

Song, W. M., Li, Y. F., Liu, J. Y., Tao, N. N., Liu, Y., Zhang, Q. Y., Xu, T. T., Li, S. J., An, Q. Q., Liu, S. Q., Yu, C. B., Gao, L., Yu, C. X., Zhang, M., & Li, H. C. (2020). Drug resistance of previously treated tuberculosis patients with diabetes mellitus in Shandong, China. *Respiratory Medicine*, *163*, 105897. https://doi.org/10.1016/j.rmed.2020.105897

Suprak, D. (2004). Bridging the Gap Between the Strength Coach and Athletic Trainer. *Strength and Conditioning Journal*, *26*(2), 30–32. https://doi.org/10.1519/00126548-200404000-00006

Sutton, J., & Austin, Z. (2015). Qualitative Research: Data Collection, Analysis, and Management. *The Canadian Journal of Hospital Pharmacy*, *68*(3). https://doi.org/10.4212/cjhp.v68i3.1456

Taherdoost, H. (2016). Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. *SSRN Electronic Journal*. Published. https://doi.org/10.2139/ssrn.3205040

Talpey, S. W., & Siesmaa, E. J. (2017). Sports Injury Prevention: The Role of the Strength and Conditioning Coach. *Strength & Conditioning Journal*, *39*(3), 14–19. https://doi.org/10.1519/ssc.0000000000000301

Chapter 4. Summary and Future Directions

The purpose of study was to explore the interdepartmental integration between athletic trainers and strength and conditioning coaches. Forty participants (n = 40) completed the survey with at least one question. Twenty-eight (n = 28) were in the athletic training profession, and twelve (n = 12) were in the strength and conditioning profession. The results showed overall integration between ATs and SCCs were interactive and collaborative. Communication and collaboration were indicated as a factor of interdepartmental relationship between ATs and SCCs especially for injury management. The communication quality between most ATs and SCCs was high. SCCs would communicate daily, while ATs would communicate few times a week. Communication was made through the variety of methods. SCCs seemed to have taken the educational course regarding athletic training/sports medicine more than ATs (75.0% > 60.7%). For those who have taken the course (AT: n =17; SCC: n = 9), fourteen ATs believed the course regarding strength and conditioning prepared them to communicate with SCCs, while five SCCs did with ATs after the course regarding athletic training/sports medicine. Collaboration through rehabilitation was identified high between ATs and SCCs. Most of ATs and SCCs had a shared vision or goal to "help athletes get better." Injury prevention, athlete monitoring, movement corrections, and return to play were identified as the shared vision and collaborative activities between ATs and SCCs. Therefore, the overall interdepartmental integrations between participated ATs and SCCs were interactive and collaborative.

In this study, a limitation was a lack of quantitative fundamentals such as generalization, validity, and reliability of the survey. Future research should consider minimizing such limitations to gain generalized conclusions to explore the integration between ATs and SCCs. In addition, further research is needed to explore specific integrative activities while considering risk and responsibilities during integration, interpersonal relationship with behavioral

consideration, and performance quality as a result of interdepartmental integration between ATs and SCCs.

References

Agarwal, N. K. (2011). Verifying survey items for construct validity: A two-stage sorting procedure for questionnaire design in information behavior research. *Proceedings of the American Society for Information Science and Technology*, *48*(1), 1–8. https://doi.org/10.1002/meet.2011.14504801166

Austin, Z., & Sutton, J. (2014). Qualitative Research: Getting Started. *The Canadian Journal of Hospital Pharmacy*, *67*(6). https://doi.org/10.4212/cjhp.v67i6.1406

Bachelor's Degree. (n.d.). Collegiate Strength and Conditioning Coaches Association. Retrieved May 16, 2021, from https://www.cscca.org/certification/bachelors_degree

Bedwell, W. L., Wildman, J. L., DiazGranados, D., Salazar, M., Kramer, W. S., & Salas, E. (2012). Collaboration at work: An integrative multilevel conceptualization. *Human Resource Management Review*, *22*(2), 128–145. https://doi.org/10.1016/j.hrmr.2011.11.007

Bernard, R. H., Ryan, G. W., & Wutich, A. Y. (2016). *Analyzing Qualitative Data: Systematic Approaches* (Second ed.). SAGE Publications, Inc.

Board of Certification, Inc. (2020). *2020 Annual Report*. https://7f6907b2.flowpaper.com/2020BOCAnnualReport/#page=1

Chiocchio, F., Grenier, S., O'Neill, T. A., Savaria, K., & Willms, J. D. (2012). The effects of collaboration on performance: a multilevel validation in project teams. *International Journal of Project Organisation and Management*, *4*(1), 1. https://doi.org/10.1504/ijpom.2012.045362

Commission on Accreditation of Athletic Training Education. (2018, February). *2020 Standards for Accreditation of Professional Athletic Training Programs Crosswalk*.

https://caate.net/pp-standards/

Courson, R., Goldenberg, M., Adams, K. G., Anderson, S. A., Colgate, B., Cooper, L., Dewald, L., Floyd, R., Gregory, D. B., Indelicato, P. A., Klossner, D., O'Leary, R., Ray, T., Selgo, T., Thompson, C., & Turbak, G. (2014). Inter-Association Consensus Statement on Best Practices for Sports Medicine Management for Secondary Schools and Colleges. *Journal of Athletic Training*, *49*(1), 128–137. https://doi.org/10.4085/1062-6050-49.1.06

Covell, C. L., Sidani, S., & Ritchie, J. A. (2012). Does the sequence of data collection influence participants' responses to closed and open-ended questions? A methodological study. *International Journal of Nursing Studies*, *49*(6), 664–671. https://doi.org/10.1016/j.ijnurstu.2011.12.002

Creswell, J. W. (2008). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (3rd ed.). SAGE Publications, Inc.

Creswell, J. W., & Creswell, D. J. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). SAGE Publications, Inc.

Cypress, B. S. (2017). Rigor or Reliability and Validity in Qualitative Research. *Dimensions of Critical Care Nursing*, *36*(4), 253–263. https://doi.org/10.1097/dcc.0000000000000253

Dorgo, S. (2009). Unfolding the Practical Knowledge of an Expert Strength and Conditioning Coach. *International Journal of Sports Science & Coaching*, *4*(1), 17–30. https://doi.org/10.1260/1747-9541.4.1.17

Dotterweich, A. R., Swisher, A., Clendenin, S., Palmero, M., Greene, A. E., & Walker, J. T. (2013). Creation of a Sport Performance Enhancement Group Using a Benefits-Based Programming Model. *Journal of Coaching Education*, *6*(1), 76–95. https://doi.org/10.1123/jce.6.1.76

Edwards, F. J. (2018). Good Interdepartmental Relationships: The Foundations of a Solid Emergency Department. *Advanced Journal of Emergency Medicine*, *2*(2), e14. https://doi.org/10.22114/AJEM.v0i0.54

Ekstrand, J., Lundqvist, D., Davison, M., D'Hooghe, M., & Pensgaard, A. M. (2018). Communication quality between the medical team and the head coach/manager is associated with injury burden and player availability in elite football clubs. *British Journal of Sports Medicine*, *53*(5), 304–308. https://doi.org/10.1136/bjsports-2018-099411

Fu, F. H., Tjoumakaris, F. P., & Buoncristiani, A. (2007). Building a Sports Medicine Team. *Clinics in Sports Medicine*, *26*(2), 173–179. https://doi.org/10.1016/j.csm.2006.12.003

Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *ECTJ*, *29*(2). https://doi.org/10.1007/bf02766777

Hamson-Utley, J. J., Martin, S., & Walters, J. (2008). Athletic Trainers' and Physical Therapists' Perceptions of the Effectiveness of Psychological Skills Within Sport Injury Rehabilitation Programs. *Journal of Athletic Training*, *43*(3), 258–264. https://doi.org/10.4085/1062-6050-43.3.258

Hanson, W. E., Creswell, J. W., Clark, V. L. P., Petska, K. S., & Creswell, J. D. (2005). Mixed methods research designs in counseling psychology. *Journal of Counseling Psychology*, *52*(2), 224–235. https://doi.org/10.1037/0022-0167.52.2.224

Hardesty, D. M., & Bearden, W. O. (2004). The use of expert judges in scale development. *Journal of Business Research*, *57*(2), 98–107. https://doi.org/10.1016/s0148-2963(01)00295-8

Heaney, C. A., Rostron, C. L., Walker, N. C., & Green, A. J. (2017). Is there a link between

previous exposure to sport injury psychology education and UK sport injury rehabilitation professionals' attitudes and behaviour towards sport psychology? *Physical Therapy in Sport*, *23*, 99–104. https://doi.org/10.1016/j.ptsp.2016.08.006

The History of the Southern Conference. (n.d.). Southern Conference. Retrieved August 15, 2021, from https://soconsports.com/sports/2008/6/30/177772.aspx

Kahn, K. B. (1996). Interdepartmental Integration: A Definition with Implications for Product Development Performance. *Journal of Product Innovation Management*, *13*(2), 137–151. https://doi.org/10.1111/1540-5885.1320137

Kahn, K. B. (2001). Market orientation, interdepartmental integration, and product development performance. Journal of Product Innovation Management, 18(5), 314–323. https://doi.org/10.1111/1540-5885.1850314

Kahn, K. B., & Mentzer, J. T. (1996). Logistics and interdepartmental integration. *International Journal of Physical Distribution & Logistics Management*, *26*(8), 6–14. https://doi.org/10.1108/09600039610182753

Kakavas, G., Malliaropoulos, N., Bikos, G., Pruna, R., Valle, X., Tsaklis, P., & Maffulli, N. (2020). Periodization in Anterior Cruciate Ligament Rehabilitation: A Novel Framework. *Medical Principles and Practice*, *30*(2), 101–108. https://doi.org/10.1159/000511228

Kane, & Borgatti. (2011). Centrality-Is Proficiency Alignment and Workgroup Performance. *MIS Quarterly*, *35*(4), 1063. https://doi.org/10.2307/41409973

Kontor, K. (1989). Editorial: Defining a profession. *National Strength & Conditioning Association Journal*, *11*(4), 75. https://journals.lww.com/nsca-scj/Citation/1989/08000/EDITORIAL__Defining_a_profession.11.aspx

Long, T., & Johnson, M. (2000). Rigour, reliability and validity in qualitative research. *Clinical*

Effectiveness in Nursing, *4*(1), 30–37. https://doi.org/10.1054/cein.2000.0106

Lub, V. (2015). Validity in Qualitative Evaluation: Linking Purposes, Paradigms, and Perspectives. *International Journal of Qualitative Methods*, *14*(5), 1–8. https://doi.org/10.1177/1609406915621406

Mathieu, J. E., Gilson, L. L., & Ruddy, T. M. (2006). Empowerment and team effectiveness: An empirical test of an integrated model. *Journal of Applied Psychology*, *91*(1), 97–108. https://doi.org/10.1037/0021-9010.91.1.97

Menon, A., Jaworski, B. J., & Kohli, A. K. (1997). Product Quality: Impact of Interdepartmental Interactions. *Journal of the Academy of Marketing Science*, *25*(3), 187–200. https://doi.org/10.1177/0092070397253001

NATA Professional Education Council. (2011). *Athletic Training Education Competencies 5th Edition*. Commission on Accreditation of Athletic Training Education. https://caate.net/wp-content/uploads/2014/06/5th-Edition-Competencies.pdf

National Athletic Trainers' Association. (2010, January). *Athletic Training Services*. https://www.nata.org/sites/default/files/guide_to_athletic_training_services.pdf

National Athletic Trainers' Association. (2017, November). *NATA Fact Sheet*. https://www.nata.org/sites/default/files/nata-fact-sheet.pdf

National Strength and Conditioning Association. (2020, July). NSCA Certification Handbook. https://www.nsca.com/globalassets/certification/certification-pdfs/certification-handbook.pdf

NSCA Strength and Conditioning Professional Standards and Guidelines. (2017). *Strength & Conditioning Journal*, *39*(6), 1–24. https://doi.org/10.1519/ssc.0000000000000348

Onwuegbuzie, A. J., & Johnson, R. B. (2006). The Validity Issue in Mixed Research. *Research*

in the Schools, *13*(1), 48–63. https://www.proquest.com/scholarly-journals/validity-issue-mixed-research/docview/211030483/se-2?accountid=10771

Potach, D. H., & Grindstaff, T. L. (2015). Rehabilitation and Reconditioning. In G. G. Haff, T. N. Triplett, & National Strength and Conditioning Association (Eds.), *Essentials of Strength Training and Conditioning* (4th ed., pp. 605–620). Human Kinetics.

Prentice, W. (2020). *Principles of Athletic Training: A Guide to Evidence-Based Clinical Practice* (17th ed.). McGraw-Hill Education.

Reiman, M. P., & Lorenz, D. S. (2011). Integration of strength and conditioning principles into a rehabilitation program. *International Journal of Sports Physical Therapy*, *6*(3), 241–253. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3164002/

Smyth, J., Dillman, D., Christian, L., & McBride, M. (2009). Open-Ended Questions in Web Surveys: Can Increasing the Size of Answer Boxes and Providing Extra Verbal Instructions Improve Response Quality? *The Public Opinion Quarterly*, *73*(2), 325–337. http://www.jstor.org/stable/25548082

Song, W. M., Li, Y. F., Liu, J. Y., Tao, N. N., Liu, Y., Zhang, Q. Y., Xu, T. T., Li, S. J., An, Q. Q., Liu, S. Q., Yu, C. B., Gao, L., Yu, C. X., Zhang, M., & Li, H. C. (2020). Drug resistance of previously treated tuberculosis patients with diabetes mellitus in Shandong, China. *Respiratory Medicine*, *163*, 105897. https://doi.org/10.1016/j.rmed.2020.105897

Suprak, D. (2004). Bridging the Gap Between the Strength Coach and Athletic Trainer. *Strength and Conditioning Journal*, *26*(2), 30–32. https://doi.org/10.1519/00126548-200404000-00006

Sutton, J., & Austin, Z. (2015). Qualitative Research: Data Collection, Analysis, and Management. *The Canadian Journal of Hospital Pharmacy*, *68*(3).

https://doi.org/10.4212/cjhp.v68i3.1456

Taherdoost, H. (2016). Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. *SSRN Electronic Journal*. Published. https://doi.org/10.2139/ssrn.3205040

Talpey, S. W., & Siesmaa, E. J. (2017). Sports Injury Prevention: The Role of the Strength and Conditioning Coach. *Strength & Conditioning Journal*, *39*(3), 14–19. https://doi.org/10.1519/ssc.0000000000000301

Thomas, J. R., Nelson, J. K., & Silverman, S. J. (2015). *Research Methods in Physical Activity* (Seventh ed.). Human Kinetics.

Tsang, S., Royse, C., & Terkawi, A. (2017). Guidelines for developing, translating, and validating a questionnaire in perioperative and pain medicine. *Saudi Journal of Anaesthesia*, *11*(5), 80. https://doi.org/10.4103/sja.sja_203_17

APPENDICES

Appendix A: Survey

Yoshi Kojima Research

Welcome to My Survey

Dear Participant:

My name is Yoshi Kojima, and I am a graduate student at East Tennessee State University. I am working on my master's degree in Applied Sport Science. In order to finish my studies, I need to complete a research project. The name of my research study is Interdepartmental communication between strength & conditioning and athletic training personnel.

The purpose of this study is to examine the relationship and preferred communication methods of strength & conditioning and sports medicine personnel . I would like to give a brief online survey to strength & conditioning coaches as well as athletic trainers using SurveyMonkey. It should only take about 5 minutes to finish. You will be asked questions about your relationship and collaboration with the other profession. Since this study deals with your current relationships and communication preferences, the risks are minimal. No direct identifying information will be collected. There are no direct benefits to you or others.

Your confidentiality will be protected as best we can. Since we are using technology no guarantees can be made about the interception of data sent over the Internet by any third parties, just like with emails. We will make every effort to make sure that your name is not linked with your answers. SurveyMonkey has security features that will be used: No identifiable information or IP addresses will be collected.

Although your rights and privacy will be maintained, the research records may be looked at by individuals that have the legal right to see that information. This may include the ETSU IRB overseeing this research, other individuals at the University with the responsibility for ensuring we follow the rules related to this research, the federal Office of Human Research Protections (OHRP) that protects participants like you, and the research team.

Taking part in this study is voluntary. You may decide not to take part in this study. You can quit at any time. You may skip any questions you do not want to answer or you can exit the online survey form if you want to stop completely. If you quit or decide not to take part, the benefits or treatment that you would otherwise get will not be changed.

If you have any research-related questions or problems, you may contact me, Yoshi Kojima, at (660) 864-1857. I am working on this project together with my Advisor Dr. Brian Johnston, Ph.D. You may reach him at (423) 439-4007. This research is being overseen by an Institutional Review Board (IRB). An IRB is a group of people who perform independent review of research studies. You may also contact the ETSU IRB at (423) 439-6054 or irb@estu.edu for any questions you may have about your rights as a research participant.

Sincerely,

1

Yoshi Kojima
February 3, 2021

* 1. Clicking the AGREE button below indicates:

- I have read the above information
- I agree to volunteer
- I am at least 18 years old
- I am physically in the United States
- I am in the strength conditioning/sport science OR athletic training/sports medicine profession working in the Southern Conference

◯ I AGREE

◯ I do NOT AGREE

2

Yoshi Kojima Research

2. Please identify your profession

- ◯ Athletic Training/Sports Medicine
- ◯ Strength & Conditioning/Sport Performance

3

Yoshi Kojima Research

3. Please select your relationship with the athletic trainer/sports medicine personnel in your department.

- ◯ Extremely effective
- ◯ Very effective
- ◯ Somewhat effective
- ◯ Not so effective
- ◯ Not at all effective

4. Considering your response to the previous question, please explain your relationship with the athletic trainer/sports medicine personnel in your department.

5. How often do you interact professionally with your athletic trainer/sports medicine personnel?

- ◯ Every day
- ◯ A few times a week
- ◯ About once a week
- ◯ A few times a month
- ◯ Once a month
- ◯ Less than once a month

6. When you communicate professionally with your athletic training/sports medicine personnel, how would you rate the level of communication?

- ◯ Very high quality - Communication is present and Productive
- ◯ High quality - Communication is present but could be improved
- ◯ Neither high nor low quality - No Relationship
- ◯ Low quality - Communication is present and somewhat productive
- ◯ Very low quality - Communication is present but non productive

7. Please identify the most common ways that you interact professionally with your athletic trainer/sports medicine personnel. (Please select all that apply)

- ☐ In-person meetings
- ☐ Phone calls
- ☐ Text messages
- ☐ Other (please specify)
- ☐ Emails
- ☐ Virtual (Zoom, Panopto, etc.)
- ☐ No Communication

8. Have you taken a course related to athletic training/sports medicine/injury prevention?

- ◯ Yes
- ◯ No

5

Yoshi Kojima Research

9. If yes, do you believe the course information prepared you to effectively communicate with your athletic trainer/sports medicine personnel?

- ◯ Yes
- ◯ No

Based on your response, please explain in detail

10. Do you collaborate with your athletic trainer/sports medicine personnel to provide appropriate training and rehabilitation for your athletes?

- ◯ Yes
- ◯ No

Based on your response, please explain in detail

11. Do you believe that your athletic trainer/sports medicine personnel shares the same vision for athlete development throughout the rehabilitation process?

- ◯ Yes
- ◯ No

Based on your response, please explain in detail

Yoshi Kojima Research

12. Please select your relationship with the strength & conditioning/sport performance personnel in your department.

- ◯ Extremely effective
- ◯ Very effective
- ◯ Somewhat effective
- ◯ Not so effective
- ◯ Not at all effective

13. Considering your response to the previous question, please explain your relationship with the strength & conditioning/sport performance personnel in your department.

14. When you communicate professionally with your strength & conditioning/sport performance personnel, how would you rate the level of communication?

- ◯ Very high quality - Communication is present and Productive
- ◯ High quality - Communication is present but could be improved
- ◯ Neither high nor low quality - No Relationship
- ◯ Low quality - Communication is present and somewhat productive
- ◯ Very low quality - Communication is present but non productive

15. How often do you interact professionally with your strength & conditioning/sport performance personnel?

- ◯ Every day
- ◯ A few times a week
- ◯ About once a week
- ◯ A few times a month
- ◯ Once a month
- ◯ Less than once a month

16. Please identify the most common ways that you interact professionally with your strength & conditioning/sport performance personnel. (Please select all that apply)

- ☐ In-person meetings
- ☐ Phone calls
- ☐ Text messages
- ☐ Other (please specify)
- ☐ Emails
- ☐ Virtual (Zoom, Panopto, etc.)
- ☐ No Communication

17. Have you taken a course related to strength & conditioning/sport performance?

- ◯ Yes
- ◯ No

8

Yoshi Kojima Research

18. If yes, do you believe the course information prepared you to effectively communicate with your strength & conditioning/sport performance personnel?

- ◯ Yes
- ◯ No

Based on your response, please explain in detail

19. Do you collaborate with your strength & conditioning/sport performance personnel to provide appropriate training and rehabilitation for your athletes?

- ◯ Yes
- ◯ No

Based on your response, please expand in detail

20. Do you believe your strength & conditioning/sport performance personnel share the same vision for athlete development through the rehabilitation process?

- ◯ Yes
- ◯ No

Based on your response, please explain in detail

Yoshi Kojima Research

Thank you for your participation in this research.

10

Appendix B: Invitation Email Letter

Hello,

My name is Yoshi Kojima, and I am a graduate student at East Tennessee State University (ETSU), and I am conducting a research study exploring the interdepartmental relationship between strength and conditioning coaches and athletic trainers. I am asking that strength and conditioning coaches as well as athletic trainers in the Southern Conference consider completing a short (5 minute) survey to examine the communication, collaboration and education of the two professions. Participation is voluntary, and the risks are minimal. If you have any questions, please contact me at kojima@etsu.edu or 660-864-1857.

If there are other members of your staff that are in the fields of strength and conditioning or athletic training, please forward this email to them so that they are able to participate.

The results of the study seek to improve collaboration between these two professions and ultimately student-athlete performance.

If you are interested in this survey, please follow the link here:
https://www.surveymonkey.com/r/YK2021

Sincerely,

Yoshihiro Kojima
Master's Student in Applied Sports Science
Graduate Assistant Athletic Trainer (Baseball)
East Tennessee State University
kojima@etsu.edu
660-864-1857

Appendix C: Descriptive Analysis

Closed Questions	Profession		Chi-square	Fisher's Exact	Odds Ratio
	ATs n (%)	SCCs n (%)	*p* value	*p* value	
Relationship with the other profession			0.461	0.499	
Extremely effective	7 (25.0%)	5 (41.7%)			
Very effective	15 (53.6%)	4 (33.3%)			
Somewhat effective	6 (21.4%)	3 (25.0%)			
Not so effective	0 (0%)	0 (0%)			
Not all effective	0 (0%)	0 (0%)			
Communication Quality			0.673	0.765	
Very high quality	9 (32.1%)	6 (50.0%)			
High quality	16 (57.1%)	5 (41.7%)			
Neither high nor low quality	1 (3.6%)	0 (0%)			
Low quality	2 (7.1%)	1 (8.3%)			
Very low quality	0 (0%)	0 (0%)			
Communication Frequency			0.042	0.013	
Every day	11 (39.3%)	10 (83.3%)	0.011	0.016	0.129
A few times a week	15 (53.6%)	1 (8.3%)	0.007	0.012	12.692
About once a week	1 (3.6%)	1 (8.3%)	0.527	0.515	N/A
A few time a month	1 (3.6%)	0 (0%)	0.507	1	0.407
Communication Methods					
In-person meetings	22 (78.6%)	9 (75.0%)	0.804	1	1.222
Phone calls	15 (42.9%)	7 (58.3%)	0.781	1	0.824
Text messages	20 (71.4%)	10 (83.3%)	0.426	0.693	0.5
Emails	21 (75.0%)	10 (83.3%)	0.563	0.697	0.6
Virtual	1 (3.6%)	5 (41.7%)	0.002	0.006	0.052
Course Taken			0.385	0.484	0.515
Yes (Proceeded to next question)	17 (60.7%)	9 (75.0%)			
No (Skipped to collaboration)	11 (39.3%)	3 (25.0%)			
Course Effectiveness			0.278	0.344	2.8
Yes	14 (82.4%)	5 (62.5%)			
No	3 (17.6%)	3 (37.5%)			
Collaboration			0.495	0.655	0.46
Yes	23 (82.1%)	10 (90.9%)			
No	5 (17.9%)	1 (9.1%)			
Shared Vision			0.837	1	1.3
Yes	26 (92.9%)	10 (90.9%)			
No	2 (7.1%)	1 (9.1%)			

Appendix D: Thematic Coding Analysis

Open ended response	Profession		*ICR	Chi-square	Fisher's Exact	Odds ratio
	ATs n (%)	SCCs n (%)		*p* value	*p* value	
Relationship			89%; 78%			
Good relationship	23 (82.1%)	8 (66.7%)		0.283	0.4111	2.3
Bad relationship	4 (14.3%)	1 (8.3%)		0.602	1	1.833
Mutual understanding	23 (82.1%)	9 (75.0%)		0.605	0.677	1.533
Shared goal	23 (82.1%)	9 (75.0%)		0.605	0.677	1.533
Working together	23 (82.1%)	9 (75.0%)		0.605	0.677	1.533
Injury management	14 (50.0%)	6 (50.0%)		1	1	1
Course effectiveness			73%; 100%			
Helped in productive communication	8 (47.1%)	3 (37.5%)		0.653	1	1.481
NOT helped in productive communication	2 (11.8%)	2 (25.0%)		0.4	0.57	0.4
Sports med foundation	8 (47.1%)	2 (25.0%)		0.294	0.402	2.667
Injury pathology	0 (0.0%)	2 (25.0%)		0.032	0.093	0
Similar credential	1 (5.9%)	0 (0.0%)		0.484	1	N/A
Collaboration			89%; 78%			
Collaboration	16 (57.1%)	4 (36.4%)		0.243	0.3	2.333
Productive communication	16 (57.1%)	4 (36.4%)		0.243	0.3	2.333
Open to other's ideas	8 (28.6%)	6 (54.5%)		0.128	0.156	0.333
Not open to other's ideas	0 (0.0%)	2 (18.2%)		0.021	0.074	0
Return to play (RTP)	2 (7.1%)	6 (54.5%)		0.001	0.003	0.064
Progam modifications	15 (53.6%)	3 (27.3%)		0.138	0.171	3.077
Shared vision			78%; 89%			
Shared vision	12 (42.9%)	4 (36.4%)		0.711	1	1.313
No shared vision	3 (10.7%)	4 (36.4%)		0.06	0.083	0.21
Preemptive communication	1 (3.6%)	2 (18.2%)		0.123	0.187	0.167
Injury prevention	5 (17.9%)	4 (36.4%)		0.217	0.238	0.38
Athlete monitoring	0 (0.0%)	2 (18.2%)		0.021	0.074	0
Movement correction	2 (7.1%)	2 (18.2%)		0.307	0.562	0.346

*Notes: *ICR - Intercoder Reliability*

VITA

YOSHIHIRO KOJIMA

Education:	M.S., Sport Science and Coach Education, Applied Sport Science, East Tennessee State University, Johnson City, TN, 2021
	B.S., Athletic Training, University of Central Missouri, Warrensburg, MO, 2018
Professional Experience:	Seasonal Athletic Trainer, Appalachian League, USA Baseball, Johnson City Doughboys, Summer 2021
	Graduate Assistant Athletic Trainer, Baseball, East Tennessee State University, 2019-2021
	Intern Certified Athletic Trainer, Baseball, East Tennessee State University, 2018-2019
Honors and Awards:	Board of Certification Certified Athletic Trainer, 2018
	Dr. Ronald Van Dam Athletic Training Student Scholarship, 2017